NEWSLETTER

Of The

Arboretum of The Barnes Foundation

MERION, PENNSYLVANIA 19066 NUMBER 22: MARCH 1979

A Visit to Guatemala

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Although Barnes Arboretum students and alumni have visited Mexico and Costa Rica, they have never before been granted the opportunity as a group of seeing the most fascinating of all Central American countries, namely Guatemala.

It was to remedy this deficiency that our small arboretum party departed from Philadelphia on December 27, 1978, arriving late that afternoon in Guatemala City, the capital.

If we had entertained any lingering doubts as to whether we had left the temperate zone and emerged into the tropics they were at once dispelled by the vegetation which greeted us near the airport and on the short ride to our hotel.

All around us were the resplendent orange-red flowers of the African tulip tree *(Spathodea campanulata)* in full bloom. Only slightly less spectacular were oleander *(Nerium oleander)*, flame vine *(Pyrostegia ignea)* and a number of different kinds of *Hibiscus.* The median strips of the spacious Avenida la Reforma were largely occupied by two kinds of orchid tree *(Bauhinia)*, pink-flowered and white. *Brunfelsia,* with its varied-colored flowers was everywhere, and in the planters along the side-walks were such interesting plants as red powderpuff *(Calliandra haematocephala)* and Chinese hat plant *(Holmskioldia coccinea).* It goes without saying that poinsettias were unbiquitous.

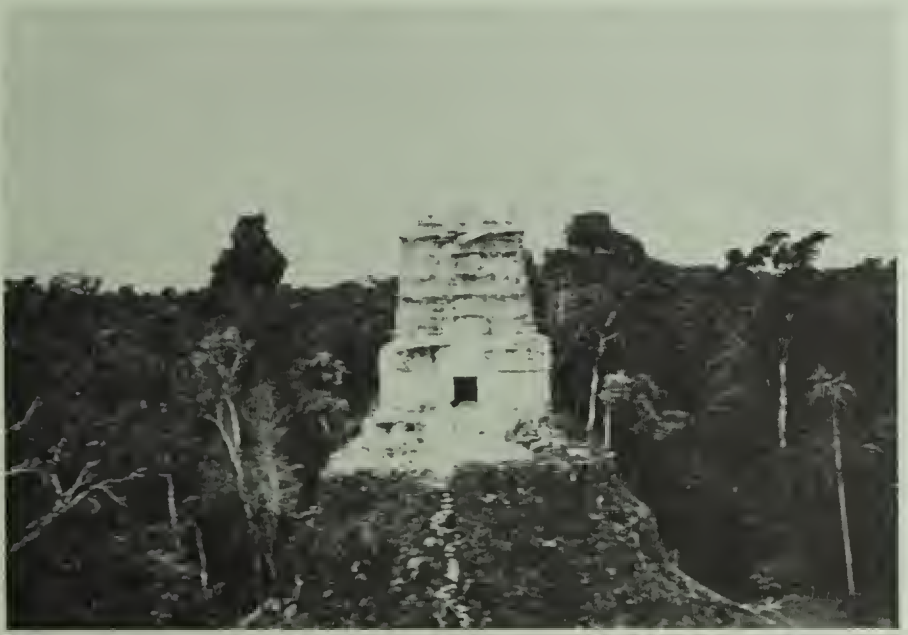

Fig. 1. Temple II, Tikal

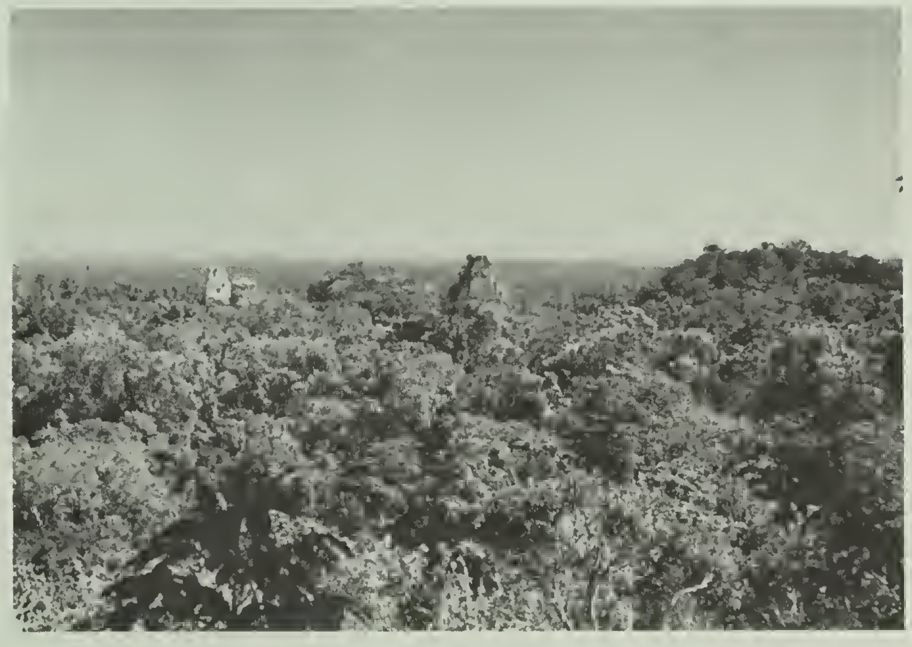

Fig. 2. Temples III and IV in rain forest, Tikal

Of the taller trees we were pleased to note the bunya pine *(Araucaria Bidwillii),* here every bit as handsome as we had seen it in its native Australia. *Taxodium mucronatum,* the same species as the Big Tree of Santa Mária del Tule in Mexico, was of frequent occurrence, as was *Cupressus funebris,* a native of China.

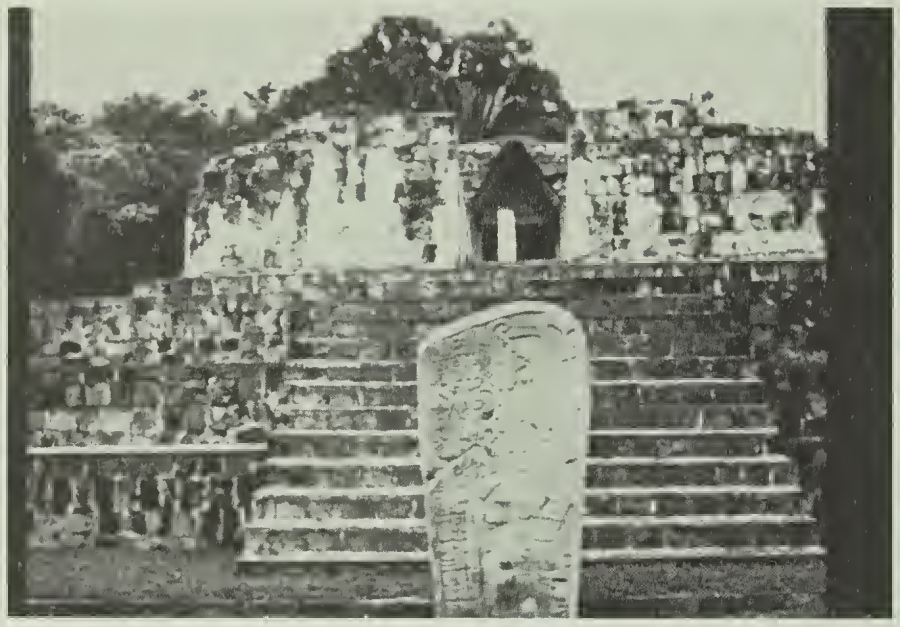

Fig. 3. Stela and temple, El Ceibal
Photo by Elizabeth C. Walker

Early the following morning we departed by plane for Tikal, the most important Mayan archaeological site in Guatemala. My wife and I had been here in the early 1960's and were delighted to observe the important changes which had since taken place.

Although the first explorations at Tikal date from the 1840's, it was not until 1956 that serious excavation and restoration were inaugurated. A major portion of this work was carried out by the Museum of the University of Pennsylvania. (Fig. 1)

The site has been too often visited and is too well known to justify a detailed description of it here. Suffice it to say that a group of temples (the highest 145 feet) is arranged about a central plaza and that many stelae and associated altarpieces dot the area. The North Acropolis, fronting the plaza, is a complex of numerous structures which faces the Central Acropolis to the south. A small museum near the landing field displays much of the material recovered by archaeologists.

Since Tikal stands in the midst of a vast tropical rain forest, a brief reference to the chief components of this vegetation seems to be in order. (Fig. 2).

Perhaps the most conspicuous plants in the surrounding forest are the strangling figs, those devastating species which, starting as seedlings high up on a tree, send down branches which surround, embrace and finally destroy the "host" plants. Another common tree was the allspice *(Pimenta dioica),* a member of the Myrtaceae, which furnishes one of the important spices of commerce. Giant trunks of mahogany *(Swietenia)* abounded, and a tree known locally as ramón proved to be *Trophis racemosa* of the Moraceae which is said to yield a nut very rich in protein. Belonging to the same family is the guarombo or *Cecropia,* one of the most characteristic genera of the American tropics, with its huge palmately lobed leaves. Another common American tree was the sapodilla *(Achras zapota)* the source of chicle, but also of a very delicious fruit. Palms, of course, were everywhere in evidence, but the one that impressed us most was *Acanthorrhiza (Chrysophila),* its slender trunks densely clothed with 4-inch long spines. A conspicuous shrub was *Hamelia,* of the Rubiaceae, with its bright orange-red tubular flowers. Epiphytic aroids, e.g., *Philodendron,* were on many of the trees, as were several kinds of epiphytic cacti, e.g. *Epiphyllum.*

Among herbaceous plants we were completely overwhelmed by the begonias, as well as the ferns, and soon gave up trying to keep an account of all the various kinds. We were intrigued by *Dorstenia,* a most unlikely-looking member of the Moraceae, in which the flowers are borne in an inflated greenish receptacle. Late that afternoon we drove some 45 miles from Tikal to Santa Elena (Flores) on the shores of Lake Petén Itzá.

On earlier visits to the Atlantic lowlands of Guatemala my wife and I had become greatly enamoured of the majestic cohune palm with its 35 foot long leaves - the longest of any palm in the world. This is *Attalea gomphococca,* a species in which the trunk is usually very short and the enormous leaves, rising from near the base of the plant, form a heavy but graceful crown. This palm had appeared as soon as we left Tikal and stayed with us for many miles. Soon there came into sight another of our favorite trees, although only of sporadic occurrence. This was the cuipo (sometimes called ceiba) or *Cavanillesia,* a member of the Bombacaeae or silk-cotton family. A distinctive feature of this species is the smooth gray trunk which rises 80 or 90 feet into the air and then branches out into a broad crown of foliage. As someone remarked, "It looks like a telegraph pole with a tree on top."

Since our hotel in Santa Elena had no dining room we walked to a nearby hostelry for our meals. The approach to this facility was lined with several interesting plants. First, there was the sea-almond *(Terminalia Catappa),* a native of the East Indies but widely planted throughout tropical America. Then there was a shrubby Euphorbia with copper-colored leaves; this was *E. cotinifolia,* a native of the West Indies. *Malvaviscus arboreus,* Turk's cap, was here too, with its reddish corollas which never fully open. It is indigenous to Mexico, but found all over the world in warm countries. Our meals at this restaurant were enlivened by a pair of tame spider monkeys which kept soliciting us for a "hand-out".

On December 29, the morning following our arrival in Santa Elena, we drove southward some 50 miles to El Ceibal, (Seibal) a relatively recently restored Mayan archaeological site. Our voyage was briefly interrupted at Sayaxche, where it became necessary to ferry our bus across the Río de la Pasión on a barge. There are several

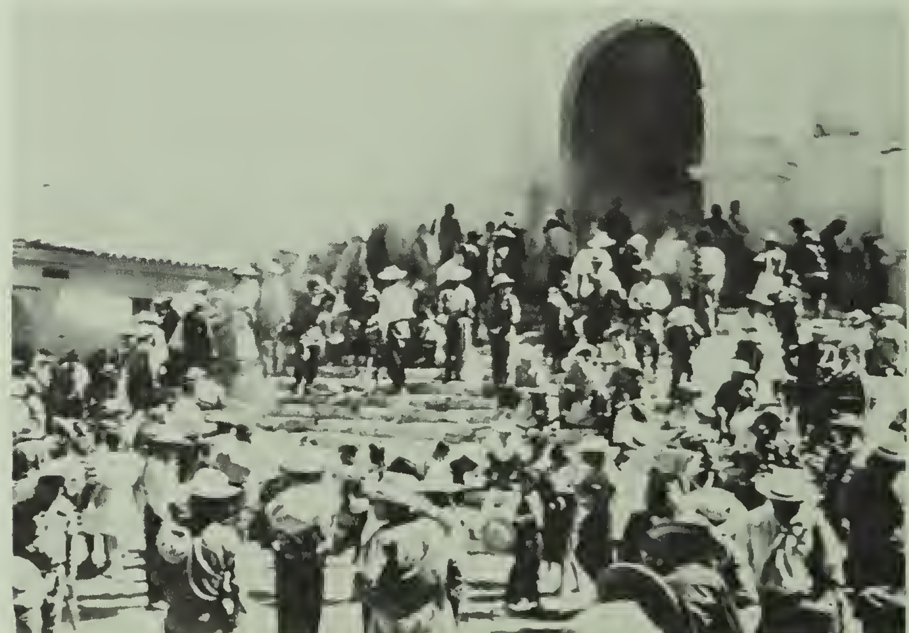

Fig. 4. Worshipers on steps of Santo Tomás, Chichicastenango.

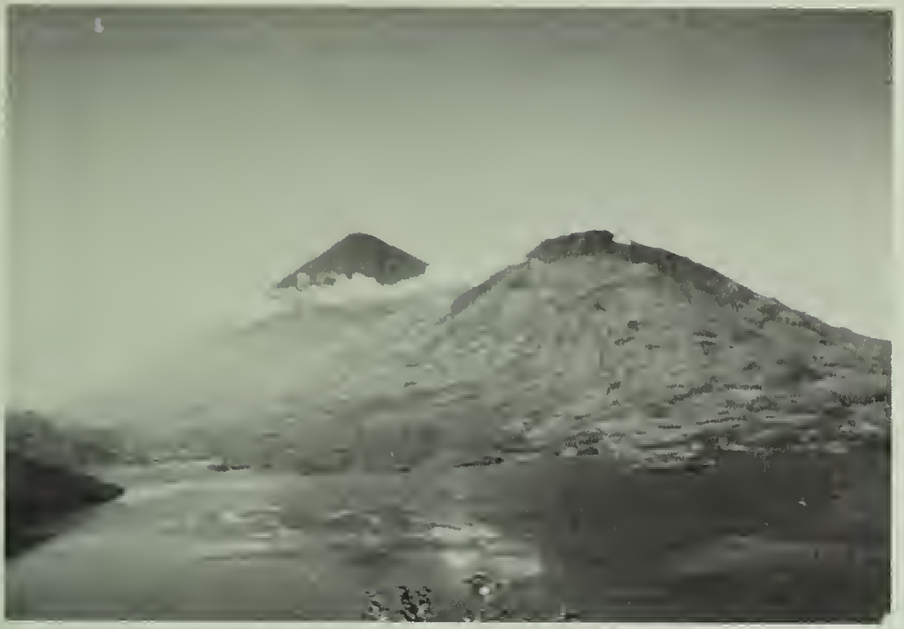

Fig. 5. Lake Atitlán

species of "tree" morning glory in Guatemala and it was on this drive that we first saw the pink-flowered one *(Ipomoea crassicaulis).* Afterwards we saw at least two of the white-flowered forms.

Arriving finally at El Ceibal we ate our box lunch on a pleasant lawn surrounded by giant evergreen fig trees, allspice and guavas.

The ruins here are distributed over a rather wide area and we walked for what seemed to be endless miles along a jungle trail and at last emerged into a clearing where there was a circular "pyramid". This reminded us strongly of one in Cuicuilco, Mexico, the only other structure of its kind we had ever seen. But, of course, its origins were quite different. All around us were species of *Ficus,* gumbo-limbo *(Elaphrium,* a tree with smooth green or brown bark which peels off in thin, papery sheets), and several species of pepper *(Piper).*

Continuing along our jungle trail, we stopped to admire a superb stela and later emerged into another and larger clearing dominated by a temple and several of the most beautifully executed stelae we had ever seen (Fig. 3).

On Saturday, December 30, we returned to the capital and early the following morning left in our own comfortable bus for Chichicastenango with its colorful Sunday market and its famous religious observances on the steps of the 400-year old church, Santo Tomás. (Fig. 4).

It was on this leg of our journey that we first saw borrajón *(Wigandia carascana)* that large-leaved, blue-flowered member of the Hydrophyllaceae, which accompanied us for many miles. Here, also, we made the acquaintance of the tree daisy *(Montanoa hibiscifolia),* a shrub or small tree of the composite family. Both are indigenous to Central America.

This seems an appropriate point to acknowledge our satisfaction with our courier, Mann Pellecer, a fifth year medical student, who was to be our mentor, guide and friend for the next ten days. He added greatly to the enjoyment and comfort of our tour.

The gardens surrounding our fine little Mayan Inn, in Chichicastenango, supported an amazing variety of interesting plants; my wife quickly compiled a list of 41 species of which the following few are worthy of mention: candlebush *(Cassia alata,* a native), cajeput *(Melaleuca quinquenervia* from Australia), Cape honeysuckle *(Tecomaria capensis* from South Africa), night jessamine *(Cestrum,* of the Solanaceae with bright orange flowers), custard apple (*Annona*), and many, many more, - a veritable botanist's paradise.

From Chichicastenango we drove on New Year's Day to Panajachel on the shores of Lake Atitlán. We descended through dense pine and live oak forests where almost every tree supported a luxuriant garden of bromeliads, most of them, we guessed, belonging to the genus *Vriesia.*

Atitlán is the most picturesque of Guatemala's lakes, being surrounded by volcanic peaks and having around its shores several native villages, three of which have their own languages. (Fig . 5). We visited the largest of these, Santiago Atitlán, on Tuesday morning, crossing the lake in a comfortable launch. Every day is market day here in Santiago and its textiles are highly regarded; a fact of which the members of our group quickly took advantage.

As we passed the Evangelical Church we heard a burst of singing and when we poked our heads inside the door a curious sight met our eyes: dozens of people were sitting on the floor husking corn (maize) and separating the kernels from the ear. They were literally sitting in a sea of corn and chanting to the beat of a leader who at once invited us to join in the singing. Another man was beating the ears of corn with a long stick, to soften them, we supposed, for the husking process.

Although our voyage across the lake had been a tranquil one, a stiff wind had now arisen and those of us who sat on the open after-deck were soon drenched by the spray. Fortunately the day was clear and the sun did its best to keep us warm.

The grounds around our lakeside hotel were attractively planted and dominated by several desert palms *(Washingtonia robusta),* their trunks bearing a dense shaggy mane of persistent leaves. (Fig. 6).

Like most lakeside resorts Panajachel is pretty much of a one-street village. As we followed its tortuous course on foot we were struck by the number of silk-oak trees *(Grevillea robusta),* a native of Australia, here in full bloom with their bright orange flowers. We stopped at the Casa Contenta, an attractive garden-type hotel where some of us had stayed years ago, but which is now a vacation center for employees of the government. In the garden here were two plants which puzzled us. One was a *Euphorbia* which the superintendent called "Flor de pascua". (Fig. 7)

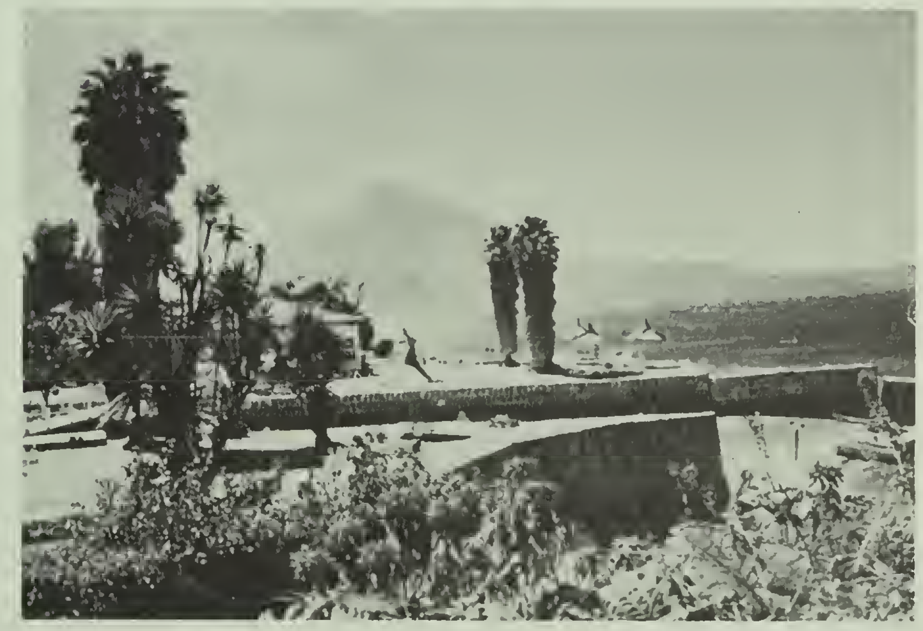

Fig. 6. Desert palms on hotel grounds, Panajachel

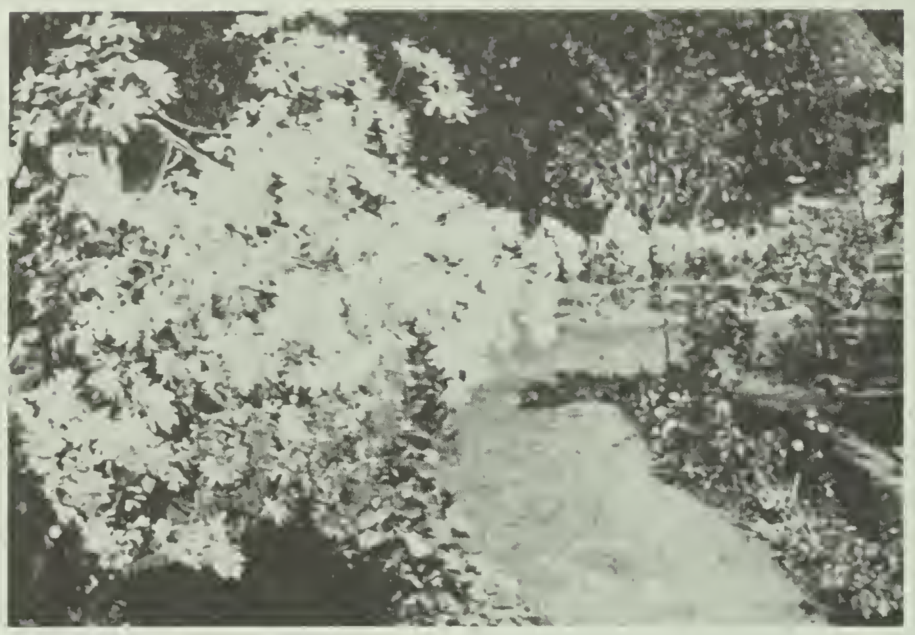

Fig. 7. Flor de pascua, Panajachel

We afterwards discovered it growing wild on our ride to Quiriguá and mention will be made of it later on. The second was a shrubby asclepiad which he named "huisquil del aire". It has large, spherical, bicarpellary, bladdery fruits and we are still hoping to find a scientific name for it.

If no mention has been made of *Thunbergia,* a climbing genus belonging to the Acanthaceae, it is certainly not because it was absent. We saw at least four species, the most attractive, perhaps, being *T. alata,* on which the orange corollas have jet-black centers. This plant has several English and Spanish names, of which the Mexican "ojo de venado" (doe's eye) seems the most appropriate. The sky-vine *(T. grandiflora)* was even more abundant, both the blue- and white-flowered forms.

On the afternoon of Wednesday, January 3, we drove through mountainous, wooded country to Antigua. For many years this city had been a teeming metropolis - the capital of Guatemala. Then, in 1773, it was so badly damaged by a series of earthquakes that the capital was shifted to its present site in Guatemala City, which is still subject to disaster, as witnessed by the severe disturbance of January, 1976.

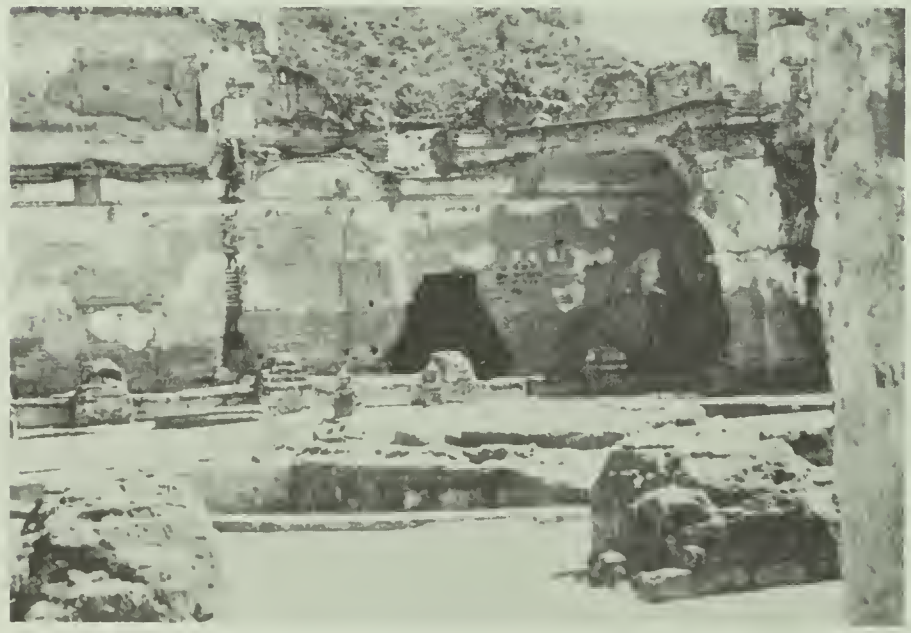

Fig. 8. Church of San Francisco, Antigua, showing earthquake damage

Indeed, among the major sightseeing features here are visits to many of its 38 churches as well as convents and monasteries which still lie in ruins, mute testimony to the catastrophe of two centuries ago. (Fig. 9).

Antigua is presided over by two volcanoes: Agua, a symmetrical cone over 12,000 feet tall, which in 1541 released a flood of dammed up waters that destroyed the second capital (Fig. 9) and Fuego, almost as tall, which is still intermittently active. Indeed, during our stay it belched forth fumes and from our hotel in Guatemala City, 30 miles distant, we could see a tongue of red-hot lava gliding down its southern flank.

It was our good fortune, through the kind offices of my wife's sister, to visit the luxurious home of Dr. and Mrs. Edwin M. Shook. I had met Ed Shook, who is a distinguished archaeologist, many years ago when he was doing some of the pioneer research at Tikal. He and his wife came to dinner at our hotel that evening and I had the pleasure of renewing his acquaintance and talking about our mutual friends at the University of Pennsylvania Museum.

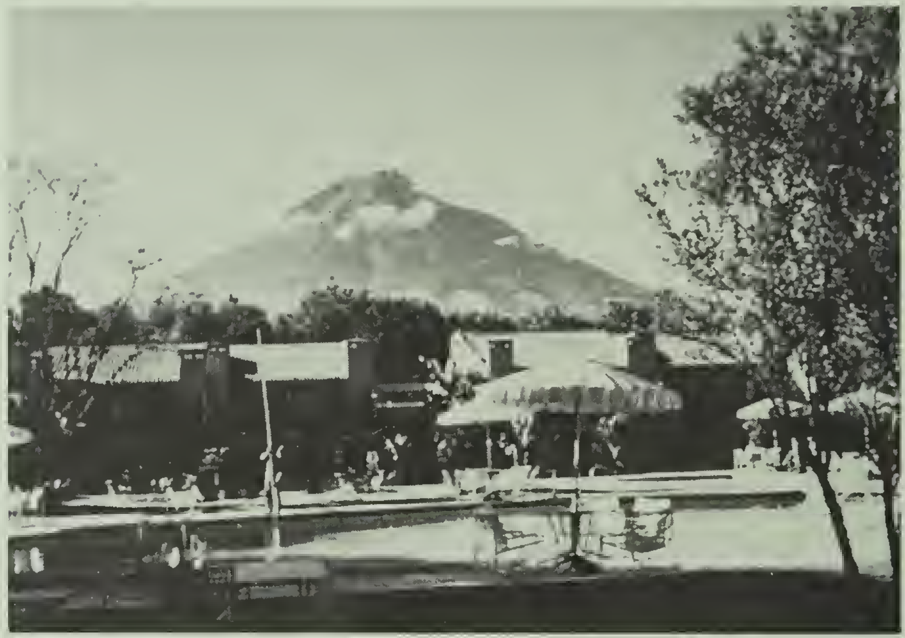

Fig. 9. Volcano Agua from Antigua

But first a few words about their house, which certainly fulfills every dream as to what a commodious tropical residence should be. Mrs. Shook told us that when they bought the property in 1970 it was largely a mass of rubble. They set about restoring it and have completed a masterpiece. We soon lost count of the rooms, but we recall a library, crammed from floor to ceiling with books and Ed's workroom, with hundreds of files and thousands of archaeological specimens laid out on long tables. And plants - plants everywhere, inside and out. Indoors, ferns, orchids, aroids and bromeliads. And on the spacious lawn, to mention only a few, sandpaper vine *(Petraea),* Natal plum *(Carissa grandiflora),* coral vine *(Antigonon),* golden dewdrop *(Duranta),* blood-red trumpet *(Phaedranthus buccinatorius,* which we had first met years ago in Taormina), copa de oro *(Allamanda),* thryallis *(Galphimia glauca),* and herald's trumpet *(Beaumontia grandiflora).* Ed's wife who, as will be divined from the above brief list, was interested in unusual plants, was delighted to show us both white- and yellow-flowered *Bougainvillea,* neither one often seen in cultivation.

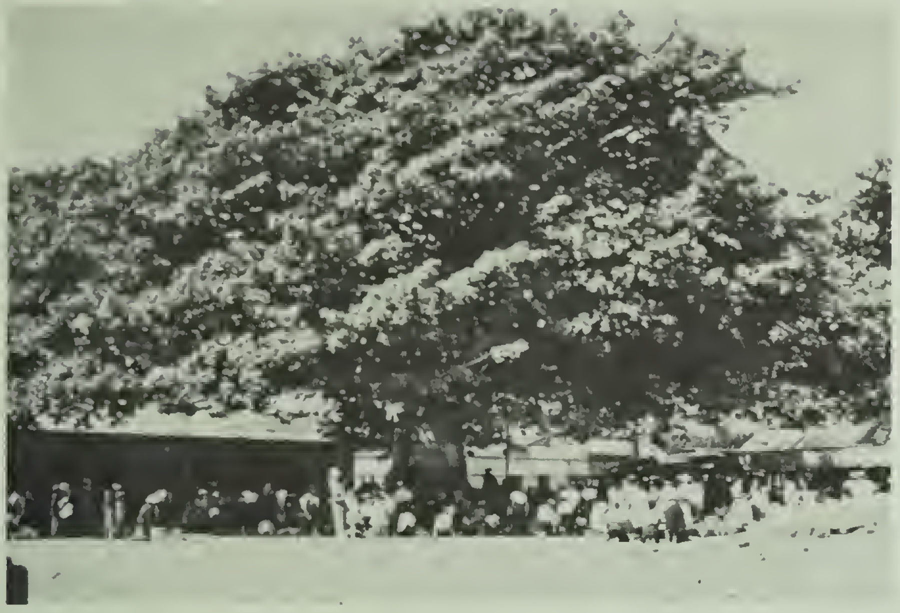

Fig. 10. The gigantic *Ceiba pentandra* at Palín

During the remainder of our all-too-brief stay in Antigua we walked a great deal around the town, inspecting the vegetation in the central square, where among other things we saw a vine with reddish samara-like fruits. This was *Securidaca,* a fascinating member of the Polygalaceae. We also visited several of the ruined structures, and ascended a hill from which we had a fine view of the city and of Fuego - quiescent at that particular moment.

The grounds around our sumptuous Hotel Antigua contained many colorful plants including a shrubby blue-flowered *Solanum* (for which we are awaiting identification) and *Pandorea ricasoliana,* a universally planted climbing member of the Bignoniaceae with pinnately compound leaves and pinkish flowers.

We returned to the capital on the afternoon of Friday, January 5 and the following day, on our itinerary, was designated as "at leisure". In the lexicon of a traveling botanist no such word exists, and so the next morning we went to visit the botanical garden at the University of Guatemala. I had written to the director two months earlier, saying that we would be here on this date and hoped to meet him and see his garden. He had never replied, and when we got there we discovered that the garden was closed and would not re-open until January 16. This was a great disappointment for we had brought with us specimens of several plants which we hoped that he or some member of his staff would identify for us. I have since written asking for his assistance.

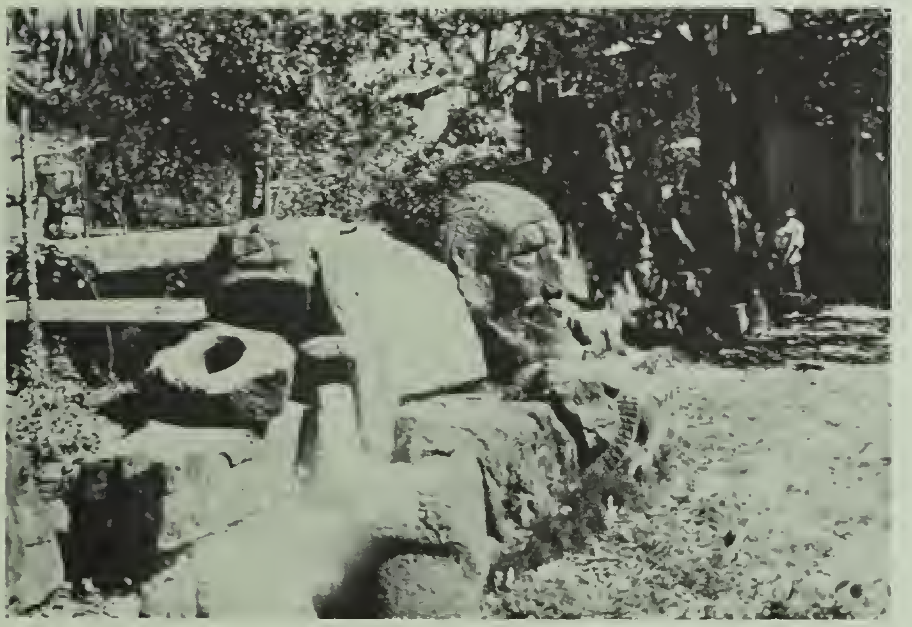

Fig. 11. Stone figures at La Democracia

The day was not entirely lost, however, for this gave us an opportunity to visit the Popul Vuh Museum, with its fine collection of artifacts, only a couple of blocks from our hotel. In the grounds of this museum was the most elegant bunya pine we had seen anywhere in our travels.

On Sunday, January 7, we set forth on an all-day drive to inspect several archaeological sites in the southern coastal area. This is an region in which Dr. Shook has carried out important studies and his instructions as to where to go and what to see were most helpful.

We climbed first to a mirador, whence we could look down upon Lake Amatitlán, another of Guatemala's beautiful lakes, and then proceeded in a southwesterly direction through Palín. The market here is held under a stately silk cotton tree *(Ceiba pentandra)* of which my wife and I have fond recollections dating back to the early 60's. It is still the same magnificent specimen, its horizontal branches (200 feet across) covering an entire city square and it gladdened our hearts to see it again. (Fig. 10).

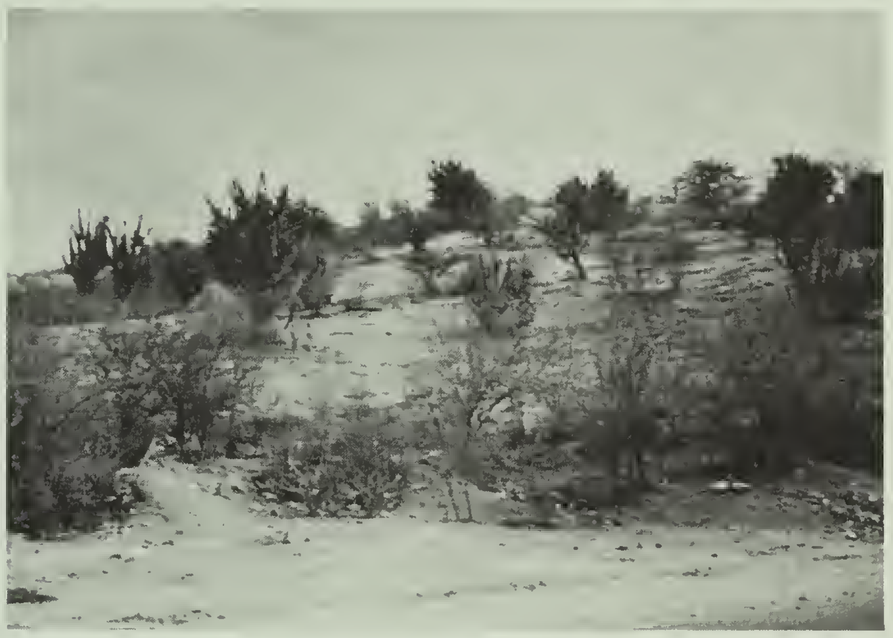

Fig. 12. Cacti east of El Progreso

From Palín we drove south to Escuintla, then headed west and again south to La Democracia. Here there was a fine museum and in the square facing it a number of gigantic stone figures, which are certainly reminiscent of the Olmec sculptures in Mexico. Dr. Shook has quite a different explanation of their provenance and we shall have to await the publciation of his studies to understand the answers to this problem. The entire area is characterized as Monte Alto culture. (Fig. 11).

From La Democracia, we continued onward toward El Baúl. We were traveling through country in which almost every field was bounded by a living hedge of colorín *(Erythrina),* just then coming into bloom with its scarlet flowers. We kept looking for the buttercup tree *(Cochlospermum vitifolium)* which is usually abundant in such habitats, and, as if in answer to our wishes, it finally

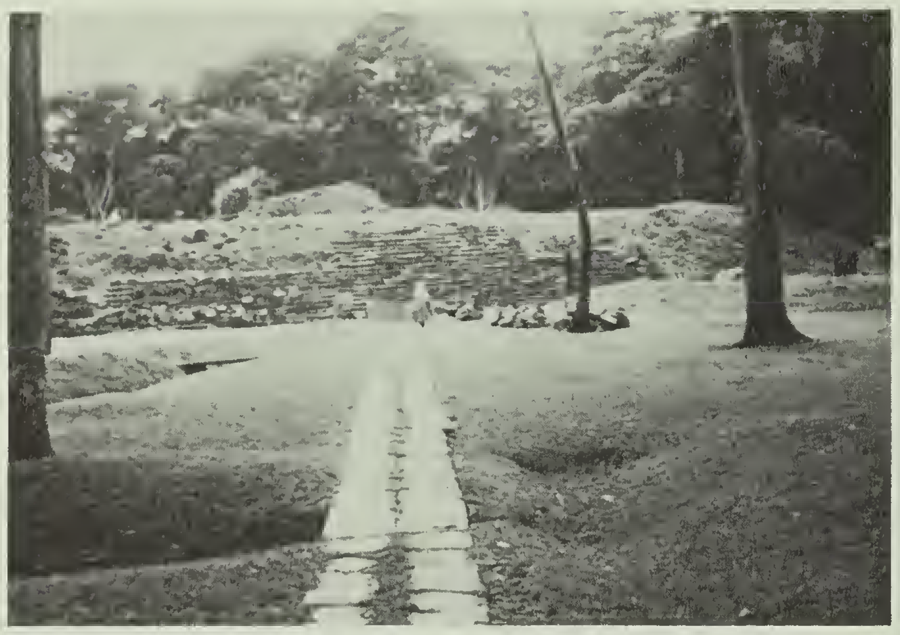

Fig. 13. Entrance to archaeological site, Quiriguá

favored us with a sight of its large yellow flowers, borne on leafless limbs. This genus belongs to a family all its own which is indigenous to Mexico and Central America.

We later visited three archaeological sites one of which was in a cow pasture, the others almost obscured in plantations of sugar cane, but all containing stone figures of great beauty and skillful execution.

Our city tour on the following day took us first to the National Palace, a building of avocado-colored stone, superb architectural design and magnificent interior decoration. It had, by remarkable good fortune, escaped the devastation of the 1976 earthquake. The same cannot be said for the nearby cathedral, which suffered so severely that entrance through its facade is now out of the question. We did, however, gain access to it through a side entrance and were thus able to form some appreciation of its monumental dimensions.

We were then taken to the top of Minerva Park which offers a fine view across the city. It was from here that we noticed Fuego in action many miles off to the north.

Our next visit was to inspect a gigantic relief map of the entire country. This measures about 2500 square meters and has a vertical scale about twice the horizontal one. Anyone who entertains doubts as to the mountainous character of Guatemala need only spend a few minutes viewing this map.

Our final portion of the morning tour was devoted to a drive around the residential section with its many beautiful homes and resplendent gardens.

On Tuesday, January 9, our last full day in Guatemala, we drove east 140 miles to visit the archaeological site of Quiriguá. The first portion of our journey took us through agricultural land with maize, cabbages and an occasional field of tobacco. The most conspicuous roadside plant here, as in many other sections of the country, was *Tecoma stans,* a bignoniaceous shrub or small tree with bright yellow flowers.

East of El Progreso we entered upon an arid region and saw our first cacti - first, that is, except for the epiphytic forms which festooned many of the trees at Tikal and El Ceibal. (Fig. 12). We stopped for a closer look and found ourselves in a veritable forest of candelabra cacti belonging to the species: *Anisocereus lepidanthus* and *Cephalocereus Maxonii,* the latter bearing large shiny white tops or cephalia. There were also two cacti of the pad type: *Opuntia guatemalensis,* a low spreading form, and a taller one, *O. tomentella.* Frank Lutman, who, as usual, wandered farther afield than the rest of us, came back with the report of a "Turk's-cap" cactus, which from his description seems almost certainly to have been *Melocactus Maxonii.* All around us was that most pernicious of euphorbiaceous plants, the mala mujer *(Jatropha urens)* the stinging hairs of which can cause painful sores. Here also were plants of *Calotropis gigantea,* an asclepiadaceous native of Asia, widely naturalized in the New World tropics.

An omnipresent weed, not only here but also in Mexico and other Central American countries, was the castor bean *(Ricinus communis).* This plant is important not only medicinally, but because its oil breaks down only under high temperatures and is therefore widely utilized as a machine lubricant. It was for this reason that it was widely cultivated during World War II. Although a native of Africa it is now frequently naturalized in tropical America, not only as a roadside weed but even in the jungle, where its large palmately lobed leaves give it every appearance of belonging to the indigenous vegetation.

Another introduction, although of more casual occurrence, was *Combretum grandiflorum,* a climbing shrub, also native to Africa, and here conspicuous because of its terminal racemes of bright orange-red flowers.

Continuing onward we came to a region where our "old friend", the buttercup tree predominated, its large yellow flowers making a cheerful show against the bare, brownish branches. In another area the commonest plant was a white flowered shrub which we stopped to collect. To our surprise this proved to be the same "flor de pascua" we had seen growing in the garden of the Casa Contenta at Atitlán; it was *Euphorbia leucocephala,* a handsome plant with its snowy inflorescences.

After about three hours of driving we descended gradually into the humid selva of the coastal plain where the annual rainfall is about 90 inches. Here, in the valley of the Motagua River, the cohune palm again dominated the country-side with its gigantic crown of leaves. We soon reached the 75 acre national park at Quiriguá, which is one of the most interesting Mayan archaeological sites in

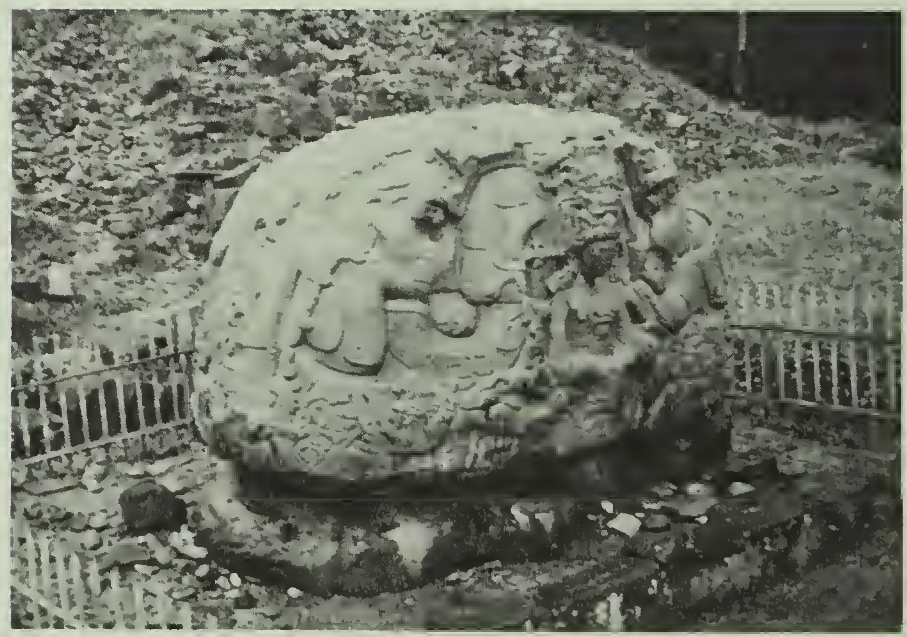

Fig. 14. Zoomorph P at Quiriguá
Photo by Elmore B. Biggs

Guatemala and, despite a light drizzle, spent an hour or so inspecting and photographing the beautiful stelae, altarpieces and zoomorphs which adorn the area.

My wife and I had been here in 1947, coming by train from Puerto Barrios, 60 miles distant on the Gulf of Honduras. At that time the site seemed to be merely a small openinging in the jungle and even now that a much larger area has been cleared it looks as though the jungle is just waiting to move in and "take over". (Fig. 13).

It was that first visit, over 30 years ago, that awakened our awareness of Mayan civilization and has since led to our traveling to almost every important center in Honduras, Guatemala and Mexico, e.g., Copán, Tikal, El Ceibal, Palenque, Kabah, Uxmal, Chichén Itzá and Tulúm.

At the entrance to the present site we noted with some surprise several large trees of teak *(Tectona grandis),* with their enormous leaves and terminal paniculate inflorescences. Now, teak is a native of southern Asia, and the presence of these specimens here will probably remain a mystery. However, they certainly seemed very much at home among the giant figs, ceibas and other native tropical trees.

The ruins at Quiriguá, with their superb monuments, belong to that period of Mayan civilization known as the Old Empire and probably date from the eight and ninth century A.D. Sylvanus G. Morley, in his excellent "Guide Book to the Ruins of Quiriguá" (1935), states that Quiriguá was probably established as a colony from Copán in Honduras.

The main attractions at Quiriguá are its nine stelae, or upright monoliths, with their deep relief carvings and inscriptions. These are situated around three sides of a large rectangle or plaza and are among the tallest found anywhere in all of Mayan ruins, in one case rising to more than 8 m. (26 feet). In front of six of these impressive shafts are blocks of stone, known as altars or zoomorphs, (Fig. 14) carved into fantastic figures, one of which can be identified as a jaguar. At the far end of the plaza are the remains of a temple and a pyramid.

It was a long day of driving through diversified terrain, but all of us felt that it was worth the effort since it brought us to a closer understanding of one of the most ancient indigenous cultures of the North American continent.

The following day we left for home by way of Miami.

Notes From The Arboretum

THE STAFF

Mrs. Farley and Dr. Fogg represented the Arboretum at the Fall Regional Meeting of the American Association of Botanical Gardens and Arboreta which was held at Longwood Gardens on November 9.

Dr. List is now pursuing research in the Pine Barrens of New Jersey on a more intensive basis than before. He is studying *Arenaria caroliniana,* the Pine Barren sandwort, from several points of view: first, from the viewpoint of the structure and anatomy of the plant with its very deep taproot, over a meter down, and secondly, from the viewpoint of its ecological relationships. It is being treated as an island community which develops over a period of years into a haven for mites, springtails and ants. The various microfauna are being studied in relation to growth of the plant in area, biomass and litter production. Possible allelopathic effects are being looked into.

Professor List has an ecology workshop scheduled to be held at Drexel from May 5th to April 5th, five Thursday night discussions, and five Saturday field trips to local ecosystems in the Delaware Valley and South Jersey. This will be a "hands-on" workshop with measurements being made on vegetation and soil composition at the salt marshes, Pinelands, Wissahickon Creek, and Delaware River Marshes.

And last but not least, List is happy to announce that he has found a collaborator for a color photography book on the nature of the Pine Barrens. The collaborator is the experienced photographer and beekeeper, James Mentzer who teaches photography at Drexel University and is a graduate in engineering from Drexel.

Dr. Marks addressed the Rutgers University Graduate Biology Seminar on "The Darwin Circle and the Darwin Fringe". He also spoke to the Biology Seminar at Saint Joseph's University on "Pipilios, Peers, and Pediatrics". As the biological representative on an interdisciplinary panel he participated in all all-day symposium, "When does Life end?" At Manor Junior College, Dr. Marks spoke on "Science, Philosphy and Religion: A Geneticist Views the Interface".

Dr. Penny has authored the section on Cretaceous and Tertiary Palynology in the forthcoming Encyclopedia of Paleontology being published by Academic Press.

Dr. Fogg was the speaker at the annual banquet of the Men's Garden Club of Delaware Valley on October 25; his topic was, "A Botanist Visits Iceland and Greenland". He lectured on the same subject at the December meeting of the Philadelphia Botanical Club. On February 8 he gave a talk on "Medicinal Plants" at the Schuylkill Valley Nature Center.

J.M.F. Jr.

THE 1978 HARVEST SHOW

"The greatest service which can be rendered to any country is to add a useful plant to its culture". These words, attributed to Thomas Jefferson, tell us of the interest in botany of this Founding Father. When man gave up the life of nomad to till the soil, he entered into competition with the diseases and insects that would destroy the food he grew. In recorded history 48 major famines have occured and new virus diseases appeared, for many of which there is still no known control. An ever increasing world population makes it more difficult to meet the demand for food.

If man is to have a lasting civilization a stable food supply is necessary. Disease resistance, increased yield from the available space, plant vigor, a short growing season, are important goals. In flowers, beauty of form and color are desired in addition to the objectives stated. To these ends the plant breeder is dedicated and every vigilant.

"Plant Breeding" was the topic chosen by the Barnes Arboretum Third Year Class for the Harvest Show Exhibit of the Pennsylvania Horticultural Society held at Memorial Hall in Philadelphia, September 30 and October 1. The concept was to cover three general areas: trees, vegetables, and flowering plants. By the end of March, three committees had been formed. Pat Levine became chair for vegetables, Betty Michell chair for flowering plants and Laura Nason chair for the tree part of our exhibit. Joseph Schrot was show chairman.

A visit was arranged to the Burpee Fordhook Farm at Doylestown, where a group of our class members was treated to a friendly, informative discussion with Burpee personnel experienced in plant breeding. We came away with some ideas and much enthusiasm for the plants we would grow for the exhibit. Our intention was to show the breeder's hybrid with the parent plants for comparison. The true parentage is not always revealed: breeders often protect their effort by not making this information available to the public.

The alcove that was first seen by visitors to the Harvest Show was the tree section and was titled "Better Plants Through Research". (Fig. 1). A collection of *Pseudotsuga Menziesii* (Douglas-fir) and *Pinus* (pine) showed the variations of color and form that occur naturally in the species. Equipment for collecting tree pollen and the method of applying the pollen for cross-breeding was shown. Two *Acer palmatum* (Japanese maple) trees, cultivars Bloodgood and Killarney, and a tray filled with seedlings resulting from crossing these two showed the variations that developed. Several young plants grown from Killarney seed as well as some from seed of Bloodgood gave further contrast to the parents. Varieties of cotoneasters provided more examples of the results of cross-breeding.

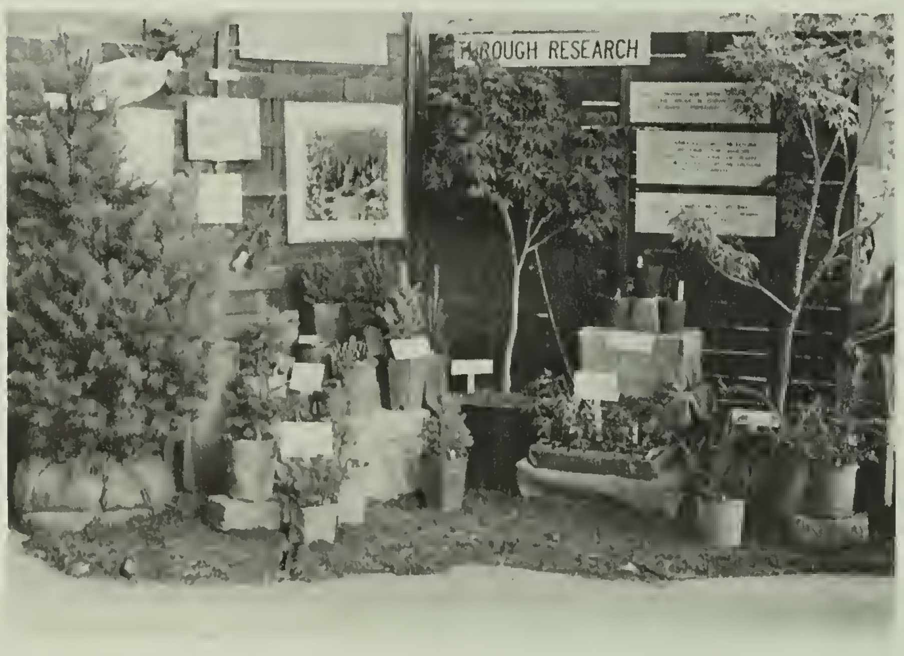

Fig. 1. Better Plants Through Research
Photo by Barbara Agre

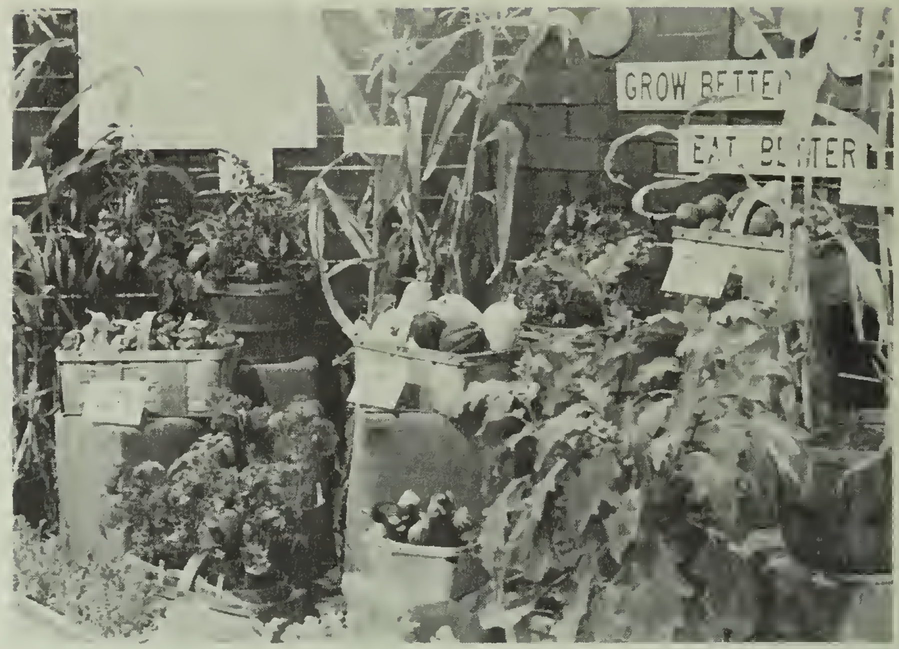

Fig. 2. Grow Better: Eat Better
Photo by Barbara Agre

The second alcove, for flowering plants, was titled "Breeding For Beauty". A collection of *Saintpaulia* (African-violet) showed the differences resulting from exposure to various doses of radiation. Hybrids of *Tagetes* (marigold) and *Zinnia* were displayed accompanying their parent plants. *Impatiens* in the Balsaminaceae were well represented with varieties that included many of the New Guinea types with their variegated foliage and handsome blooms.

The third alcove was devoted to vegetables and was titled "Grow Better-Eat Better". (Fig. 2) Baskets filled with varieties of tomatoes *(Lycopersicon esculentum),* squash *(Cucurbita* sp.*),* eggplant *(Solanum melongena)* and peppers *(Capsicum frutescens)* formed an eye-pleasing cornucopia. The plant display included sweet corn *(Zea Mays* var. *saccharata)* appropriately labeled "Father, Mother, and Offspring", *Solanum melongena* (eggplant) and two members of the Solanaceae (tomatoes and peppers). The Compositae formed a pleasant green border using several varieties of lettuce *(Lactua sativa).*

For those who had put so much effort into the exhibit, there was much satisfaction when the judges posted a notice on our screen that read "This exhibit has been presented the Pennsylvania Horticultural Society Show Trophy to an outstanding exhibit". The engraved cup has found its permanent home in the headquarters of the Barnes Arboretum.

JOSEPH SCHROT